From June, 1907

This was published seemingly just before the Kiefler motorcycle came out, making its debut in early 1908 at a Buffalo, NY sportsmen's show.

Reading this seems to show that the Kiefler brothers took the advice stated herein when they developed their 5 H.P. single cylinder motorcycle.

Just "for what it's worth" reading.

A Composite Motor Cycle

All of you know what a composite photograph is—for instance, a single photograph combining all the features and expressions of many faces, giving what may be termed an average or typical face of a large number of persons. So I am going to picture to you what I call my composite motor bicycle.

After having informed myself about the forty different models of American-made and the three imported foreign ones sold here, I have, mentally, "assembled" one, using what seemed to me the best features of each. Here are the specifications, and "we invite your inspection" and criticism.

As a preface it may be said that, up to this time, designers and builders have seemed to work upon the supposition that they are obliged to use the frame, or some modification of the common bicycle, and stick a motor somewhere or somehow on to it. The future motorcycle may see a radical change in frame design or motor position. For example, the motor may be placed away back and transmit power directly to rear axle—the most economical transmission; or the twin-cylinder may be a double-opposed horizontal engine, giving perfect balance, which the now common V position cannot.

SPECIFICATIONS.

Frame.—Best steel tubing, 14 and 16 gauge. Loop frame. We think this forms as strong a seat for the engine as where the diamond frame is cut away at the crank hanger and supports the engine by lugs to the separate ends of lower tubing and rear fork. Also, the tubing under the engine will receive blows instead of the engine being hit by obstructions in the road. Drop-forged head and strong steel connections. We see no objection to utilizing the lower portion of the frame as part of the exhaust pipe if there are strong steel connections where exhaust tube and muffler are attached to it. We would have the seat post mast farther back than usual, or curved back at the top over rear wheel, for three reasons: to allow a longer and larger tank, to bring seat farther back and to allow of longer handle bars.

Forks.—A rigid front fork strong enough for its work alone, but with the auxiliary Sager cushion fork if that shall be proven strong and reliable. It is attached very easily, and can be quickly detached for racing purposes. A trussed fork increases vibration. Extension fork-sides formin· a double handle-bar stem. This prevents twisting of bars in muddy, sandy or rutty roads. Handle bars extending backwards as far as convenient. This lessens vibration. If short they can be lengthened by strong pieces of large hose or heavy single tube tires tightly forced over grips and extending six or eight inches behind.

Wheelbase—53 to 58 inches.

Motor—Single cylinder. A good 3-h. p. for belt, and about 2¼ for chain-drive. A reserve power over and above that actually needed is a very desirable feature. It is not well to work any mechanism to its limit. This extra power admits of slower as well as faster running than a small engine, has larger bearing surfaces, insuring longer life, and the larger flywheels aid in lessening vibration. Also, a large engine, for a given power, will keep in order longer than a small, high-compression, finely tuned engine of same power. After many inquiries we fail to discover any good reason for the ordinary rider using a multi-cylinder engine if a single cylinder will give power enough for his purpose—and it usually will. The greater speed appeals only to racing men; the lessened vibration and strain on bearings, spokes and tires do not, in our opinion, offset the greater complication, extra valves, etc., of the multi-cylinder motors.

Position.—As low as possible and have sufficient road clearance—say 6 inches—4 inches is not enough. Upright and well

forward. This gives better balance, a lower centre of gravity, making for easier control, safety in rounding corners, and less danger of side-slipping. We think an engine built high up into the seat post mast is poorly located.

Cylinder of special gray cast iron. This insures more uniform expansion. One piece head. This increases the cooling surface. Concave to resist compression.

Flanges deep—⅞ inch for deepest—and as close as possible, deepest near head where heat is greatest. Not carried to bottom of cylinder; since heat is source of power in a caloric engine all that can should be saved, and only flanges enough to insure uniform expansion of cylinder should be used, thus increasing efficiency. If the new pressed steel pistons prove successful they will be lighter and stronger. Eccentric piston rings. Oil grooves around bottom of piston lessen weight, and aid in packing and lubrication. Wrist pin secured against working laterally. Wide bearings on connecting rod and crank. Roller bearing for crank good feature. Valves and valve-seats of same material, preferably cast-iron, insuring more perfect grinding and seating. Exhaust chamber separated from cylinder by air-passage, permitting better cooling for valves and springs, and keeping bulk of casting of cylinder head as small as possible; also allowing valves of large diameter. Ball-bearing at end of valve stem a good feature. In-take valve right over exhaust valve. Exhaust port opening obliquely downwards. Guide for valve stem can be lengthened by projecting it into exhaust post. Inlet valve spring in open air. Mechanical inlet valve. This permits steadier runnings at slow speeds, easier starting and, of course, prevents sticking valve.

Sparking in exhaust chamber under inlet valve. Here it is kept cool and cleaned by incoming charge, and is fired by the most explosive mixture. If in the cylinder proper it is surrounded by the remaining burned gases, which dilute the incoming charge in the cylinder and cause misfiring and sometimes failure to ignite. The exhaust chamber with its valves and springs should be in front of the engine for better cooling. A combination relief cock a d cup (for injecting kerosene on to piston) screwed into head of cylinder is a good device. The carburetor is the least perfected part of the motorcycle. The chief difficulty seems to be an impossibility to maintain a constant level of the spirit in the float chamber, and some are predicting a return of the surface carburetor. It should be some distance from the engine for two reasons: that it may take in air as rich as possible in oxygen—that is, cold air; and because vaporization is more complete, furnishing a more perfect mixture, if the inlet pipe is of good length between carburetor and cylinder. If heat is to be introduced it should be at or near the vaporizer, and not at the air intake. A mixture regulator, or auxiliary air control, is a desirable feature. We don't know that it is settled whether a shorter stroke than bore is better than the usual practice or not. Some who have tried the short stroke —say 3¼ bore and 3-inch stroke—claim they get better balance with same weight fly-wheels, more horsepower per pound weight, and increase power without decreasing number of revolutions per minute. An oil-catcher in engine pulley is a good feature.

Ignition by high-tension magneto, in which the armature and not the circuit-breaker, is advanced or retarded to time the ignition. Transmission by improved V-belt, either all-leather or canvas-and-rubber, with rocker-joint fastener and without idler. Rear pulley of cold rolled steel, brackets part of pulley itself and inclined obliquely forward so as to take the strain of pulling more in line than if at right angles with the rim.

Wheels, 26-inch, as a compromise between 28 and 24. Tires, 2½-inch, enough more comfort in riding to pay for extra cost over 2¼-inch tires. Either G & J Bailey tread, or G & J Midgely wire tread, or Goodyear detachable, ought to be satisfactory tires. G & J double-section rim; heavy spokes. Any good 1907 coaster-brake, together with engine compression, is probably sufficient braking power; but I believe a good contracting band brake is stronger and more reliable.

Double-grip control by Bowden wire. Main control by throttle. Spark control permits introduction of mixture, which is not burned under the most advantageous conditions, and therefore wastes fuel, heats engine more and has but few advantages.

Cylinder or oval tank, two-gallon capacity, of steel, copper-plated inside, hung under top-tubing, or between two upper tubes, or a very neat way is to have tank form the upper tube. Such a tank avoids the leaking common to square-cornered tanks. Have larger filler holes than usual —1 or 1¼ inches.

Gasoline strainer in tank, also strainer under tank connecting with tube to carburetor. The Breeze Carburetor Co., of Newark, N. J., makes such a strainer.

A combined drip sight-feed by measure and force pump feed system of lubrication. Gasoline and oil needle valves on top of tank, and oil pump within easy reach. Wider and stronger pedals than commonly provided. Saddle, Persons' American Motor Seat, or his motor seat No. 2.

As an option, every maker should offer a combination luggage carrier and stand, or, better still, we think, a stand separate, to turn up under the luggage-carrier. The supports of the luggage-carrier can be clamped to the stays, and the stand swing on the axle so that it can be turned down and used without removing the baggage. A strong tool bag or case with real tools and lock and key.

HENRY H. WHEELER.